

CLAIMS

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Sub B1 1) A recombinant potyvirus infectious nucleic acid construct useful for plant cross protection, comprising a full length clone characterized only in that its HC-Pro gene conserved FRNK box sequence contains a substitution.

2) A recombinant construct according to claim 1 wherein the nucleic acid is cDNA or an RNA transcript.

3) A recombinant construct according to claim 1 wherein the substitution in the conserved FRNK box is a substitution of Arg.

4) A recombinant construct according to claim 3 wherein Arg is substituted with an amino acid of the hydrophobic group or having a bulky side chain.

5) A recombinant construct according to claim 4 wherein Arg is substituted with Ile.

Sub B2 6) A recombinant potyvirus infectious nucleic acid construct according to claim 1 wherein the potyvirus is ZYMV.

7) A recombinant construct according to claim 6 wherein the construct is ZYMV-AG1.

8) A recombinant construct according to claim 1 further containing a substitution which effectively abolishes aphid transmissibility.

9) A recombinant construct according to claim 8 wherein the substitution which effectively abolishes aphid transmissibility is a substitution of the Ala residue at position 10 in the conserved DAG triplet in the N terminal region of the CP.

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A 10) A recombinant construct according to claim 7, ~~8 and 9~~ useful for plant cross protection wherein the cross protection is against severe strains of ZYMV.

A 11) A recombinant potyvirus infectious nucleic acid construct according to claims 1-~~6~~ wherein the potyvirus is selected from BCMV, BYMV, BtMV, MWMV, OYDV, PRSV, PStV, PepMoV, PVMV, CGVBV, GEV, ISMV, JGMV, LYSV, LMV, MDMV, PPV, PVA, PVV, PVY, SCMV, SPFMV, TEV, TVMV, TBV, TuMV, WMV-2, YMV and ZYFV.

A 12) A recombinant construct according to claims ~~1-11~~ further useful for the transient expression of foreign nucleic acid in plants wherein the full length clone has, in any position, a sequence of DNA or RNA inserted into the full length clone.

13) A method for providing protection against viral infection in plants comprising inoculating plants with the recombinant potyvirus infectious construct as defined in any of the preceding claims.

14) A method according to claim 13 wherein inoculating plants is done by mechanical inoculation or by bombardment.

sub 15) A method for introducing foreign nucleic acid into plants comprising infecting a plant with a full length clone as defined in claim 11.

A 16) A method for the production of a mild strain of potyvirus comprising inoculating plants with the recombinant potyvirus infectious construct as defined in ~~any of the preceding claims~~ and collecting the resulting progeny.

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~~17) A virus containing the recombinant construct as defined by claim 1
and as produced according to claim 16.~~

18) Produce inoculated with the recombinant construct as defined in the
preceding claims and in the method according to claim 13.

19) Produce according to claim 18 wherein the produce are cucurbits.

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~~20) Compositions for plant inoculation or for transient expression of
foreign nucleic acid in plants containing, as an active ingredient, the
recombinant construct according to claim 1-12 or a virus containing the
recombinant construct according to claim 17.~~

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